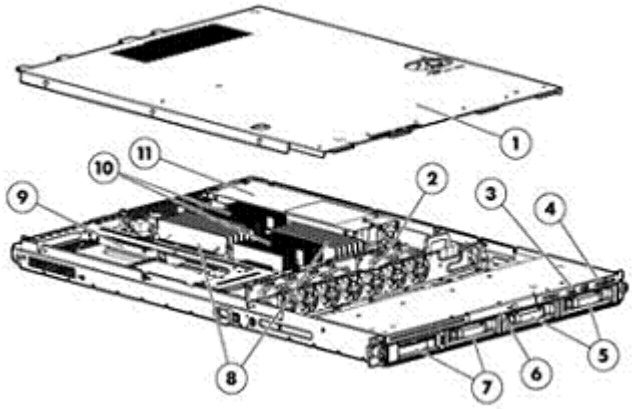
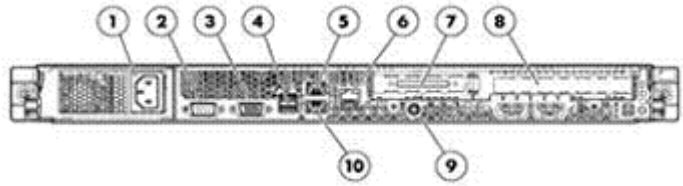
Overview

Hot Plug SAS/SATA and Non-Hot Plug SATA Models





Front View:

1. Access panel
2. System fans
3. Two USB ports
4. Power on/off & system LEDs
5. Optional 3rd and 4th 3.5" Non-Hot plug SATA or hot plug SAS/SATA hard drive bays
6. Optional DVD-RW or DVD-ROM drive
7. Standard 1st and 2nd 3.5" Non-Hot plug SATA or hot plug SAS/SATA hard drive bays
8. Twelve DIMM slots: DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory
9. Expansion Slots:
   Non-Hot Plug Models - One full-length/full height x16 PCI-Express Gen2 slot and One Low Profile x16 PCI-Express Gen2 slot

   Hot Plug Models - One available Full-length/full height x16 PCI-Express Gen2 slot, Low Profile PCI-Express Gen2 slot (used for storage controller)
10. Quad-Core Intel® Xeon® 5500 series processors (supports up to two)
11. Power supply (500 Watts - standard, other PS options available)

Rear View:

1. Power Supply Cable Socket
2. Video Port
3. Serial Port
4. Rear USB ports (2)
5. One GbE LAN ports for NIC 2 (RJ-45)
6. Optional LO100i 10/100 Mbps LAN port for IPMI management (RJ-45)
7. Low-Profile x16 PCI-Express Gen2 slot
8. Full-height PCI-Express x16
9. UID - Rear Unit Identification LED
10. One GbE LAN ports for NIC 1 (RJ-45)

What's New

- Support for SAS Midline Hard Drives

At A Glance

The HP ProLiant DL160se G6 server is a high performance, low cost, ultra-dense, dual processor capable, 1U rack server for I/O

Overview

intense High Performance Computing (HPC) environments, Web 2.0, hosting, and general heterogeneous server deployments requiring multiple PCI-e card attach.

- Processors:
  - Supports up to two Intel® Quad-Core 5500 sequence processors
    - Quad-Core Intel® Xeon® processors 5500 sequence with 8 MB Level 3 cache
  - Intel® 5520 Chipset
- Memory:
  - Up to 192GB, using 16GB Quad-Rank PC3 8500R-7 DDR3 Registered (RDIMM) memory, operating at 800MHz when populated at 2 DIMMs per Channel in 12 slots
  - Up to 96GB, using PC3-10600R DDR3 Registered (RDIMM) memory, operating at 1066MHz when populated at 2 DIMMs per Channel in 12 slots (operating at 1333MHz when using Intel X-series processors).
  - Up to 24GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when populated at 2 DIMMs per Channel in 12 slots. (operating at 1333MHz when using Intel X-series processors).
- Internal Drive Support:
  - Support for up to four 3.5" Non-Hot plug serial ATA (SATA) hard drives or;
  - Support for up to four 3.5" Hot plug Serial Attached SCSI (SAS) or SATA hard drives.
    NOTE: Installation of the Hot Plug Backplane 1U 2S Kit (512181-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.
  - Support for up to eight 2.5" Hot plug Serial Attached SCSI (SAS) or SATA hard drives.
    NOTE: Installation of the Hot Plug 8 Small Form Factor HDD Cage & Backplane G6 FIO (515938-B21) is required if ordering small form factor hard drives for Hot Plug models only.
  - Internal storage capacity of up to 8.0TB (4 x 2TB Hot Plug 3.5" SATA), 8.0TB (4 x 2TB Non-Hot Plug 3.5" SATA) or 8.0TB (4 x 2TB Hot Plug 3.5" SAS); or up to 4.0TB (8 x 500GB Hot Plug 2.5" SAS).
- Network Controller:
  - HP NC362i Integrated Dual Port Gigabit Server Adapter
- Storage Controllers:
  - Non-Hot Plug SATA Models: HP Embedded SATA RAID Controller (RAID 0, 1, 10)
    NOTE: Transfer rate: up to 3 Gb/s SATA
    NOTE: To enable RAID functionality on Embedded SATA, use the HP Smart Array B110i SATA Raid controller, To enable use of the B110i, enter the ROM Based Setup Utility (RBSU). The option for enabling RAID functionality can be found in the Advanced section of the RBSU
  - Hot Plug SAS/SATA Models: HP P210 Smart Array Controller RAID 0,1,10, 5
    NOTE: Transfer rate: up to 3Gb/s
- Expansion Slots:
  - Non-Hot Plug Models: Up to two available PCI Express 2.0 slots:
    - Slot 1: full-length/full-height PCI-Express 2.0 x16
    - Slot 2: low-profile PCI-Express 2.0 x16
  - Hot Plug Models: One available PCI-Express slot:
    - Slot 1: Full-length/full-height PCI-Express 2.0 x16
    - Slot 2: low-profile PCI-Express 2.0 x16 - slot populated by the SAS/SATA storage controller
- Infrastructure Management:
  - HP ProLiant Onboard Administrator Powered Lights-Out 100i with optional LO100i Advanced Licenses for Virtual KVM and Virtual Media.
  - The HP ProLiant Easy Set-up CDs and ISO image downloads offer Assisted and Manual single server installation, setup, and deployment capability. Capabilities provided are:
    - AutoRun
    - Assisted Installation Microsoft Windows 2003 Server and Microsoft Windows 2008 Server
    - OS and SW available for Manual Installation are listed on each servers' QuickSpecs
  - HP Insight Control suite for Linux (IC-Linux), a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple management console. The IC-Linux suite supports Linux-based servers and management consoles

Overview

- Ports:
  - Five USB ports (two front, one internal, two rear)
    NOTE: In order to utilize the internal USB port the USB cable (P/N: 536769-B21) must be connected to the internal USB header.
- Optical Drive:
  - Support for one (optional): DVD-ROM, DVD RW
- Power Supply:
  - 500W Power Supply (Non-Hot Plug, Autoswitching)
  - Optional FIO high-efficiency hot plug common slot power supplies: 460W or 750W
  - Optional FIO 400W G6 Redundant Power Supply
- Additional Features:
  - Support for NVIDIA Quadro FX3700 512MB PCIe x 16 graphics card
    NOTE: For more information on the latest visualization and acceleration qualification status, please see http://www.hp.com/go/accelerators
- Form Factor:
  - Rack (1U)
- Operating Systems:
  - Supports Windows, RHEL, SLES, Solaris, VMware, and Citrix Essentials for XenServer (Retail)
- Deployment/Serviceability:
  - HP ProLiant DL160se G6 models have fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36"
  - Tool-less access to all system components for easy in rack serviceability
  - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
- Warranty:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and parts replacement is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
    NOTE: Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Standard Features

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor One of the following depending on Model	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) NOTE: Available through Configure To Order only. See Factory Integration Models section for more details. NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.
Upgradeability	Upgradeable to two processors
Chipset	Intel® 5520 Chipset
Cache Memory	4 MB Level 3 cache (E5504) 8 MB Level 3 cache (standard)

Standard Features

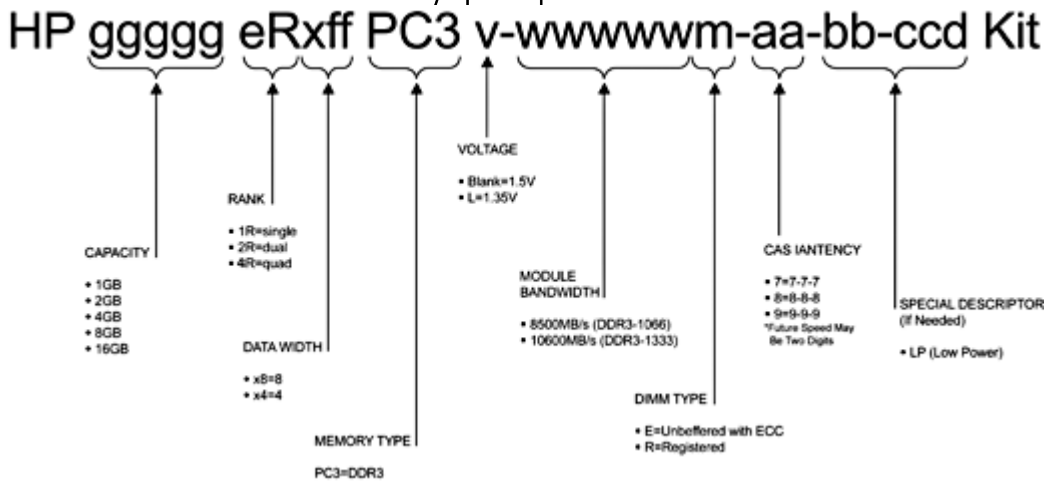
Memory Protection	Advanced memory protection

Memory

Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)	
Standard	4 GB	(2 x 2 GB) UDIMMs
	6 GB	(3 x 2 GB) UDIMMs
	12 GB	(6 x 2 GB) RDIMMs
Maximum (RDIMM)	192 GB	(12 x 16 GB)
Maximum (UDIMM)	24 GB	(12 x 2 GB)

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

DDR3 memory options part number decoder



Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter

Standard Features

Expansion Slots #	Technology	Bus Width	Connector Width*	Bus Number*	Device No.**	Form Factor	Notes
1	PCI-Express 2.0	x16	x16	1	0	Full length, full height	3.3 volts
1	PCI-X***	64-bit	N/A	5	1	Full length, full height	3.3 volts
2	PCI-Express 2.0	x16	x16	6	3	Low Profile	3.3 volts

NOTE: All slots can accept universal keyed PCI cards

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

*** PCI-X bus speed will be 133MHz when only one PCI-X card is installed. It will be 100MHz when both slots have PCI-X cards installed.

Storage Controller

Non-Hot Plug SATA Models

HP Embedded SATA RAID Controller (integrated into the south-bridge)
NOTE: Transfer rate: up to 3 Gb/s SATA

HP Smart Array B110i SATA RAID supporting SW RAID 0,1,10
NOTE: To enable RAID on Embedded SATA, use the HP Smart Array B110i SATA Raid controller, To enable use of the B110i, enter the ROM based setup utility(RBSU). The option for enabling RAID can be found in the Advanced section of the RBSU.

Hot Plug SATA/SAS Models

HP Smart Array P212 RAID Controller (RAID 0/1/1+0)
HP Smart Array P212 Controller 256 BBWC (RAID/0/1/1+0/5/5+0)
NOTE: Transfer rate: up to 3 Gb/s SATA, up to 3 Gb/s SAS.

NOTE: A diskette drive or virtual FDD using LO100 Advanced Pack is needed to install storage controller drivers during a Windows operating system installation from a CD.
NOTE: Addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration.
NOTE: RAID 6 functionality requires the addition of Smart Array Advanced Pack (P/N: 516471-B21).
NOTE: The addition of a Smart Array hardware based storage controller to a Non-Hot Plug SATA Model is only supported for external storage.

Storage

Diskette Drives: Via USB only

Optical Drives: Optional HP 9.5mm SATA DVD-ROM Optical Drive
Optional HP 9.5mm SATA DVD RW Optical Drive

Drive Bays: Up to 4 Non-hot plug SATA 3.5" drives
Up to 4 Hot plug SAS/SATA 3.5" drives

Standard Features

Maximum Internal Storage	Non-Hot Plug SATA	8.0TB	4 x 2TB
	Hot Plug SATA	8.0TB	4 x 2TB
	Hot Plug SAS	8.0TB	4 x 2TB
	Hot Plug SFF SAS	4.0 TB	8 x 500GB
	Hot Plug SFF SATA	4.0 TB	8 x 500GB

Interfaces	Parallel	None
	Network RJ-45(Ethernet)	2 10/100/1000 NIC ports (plus 1 optional dedicated port for the HP ProLiant Lights Out 100i Remote Management)
	Serial	1
	Pointing Device (Mouse)	0 (via USB only)
	Graphics	1
	Keyboard	0 (via USB only)
	USB	5 (two front, one internal, two rear) NOTE: In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (P/N 536769-B21) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.

Graphics	32MB shared supporting all display resolutions up to 1600x1200 16bpp@75Hz NOTE: 8MB is dedicated to video memory.

Form Factor	Rack (1U), (1.75 in/4.45 cm)

Embedded Manageability	**HP ProLiant Onboard Administrator and LO100i Advanced**	HP ProLiant Onboard Administrator Powered by Lights-Out 100i with Optional LO100i Advanced Licenses for Virtual KVM and Virtual Media. Features: • Embedded IPMI standard reporting • System event log access • Remote Serial console (serial redirection) • Browser, Telnet access • SMASH-CLP compliant • IPMI 2.0 compliant • Secure Socket Layer (SSL) Encryption • Secure Shell (SSH) Encryption • Virtual media (Floppy, CD, USB 2.0) with Advanced License • Virtual Keyboard, Video, Mouse (KVM) for graphical remote console with Advanced License NOTE: Flexible and volume quantity (AKA) license kits are available for the Lights-Out 100i Advanced Pack licenses as well as Electronic License To Use (E-LTU). AKA Tracking licenses require a 100 unit minimum forecast at initial

		contract signing. For these additional part numbers, please refer to each software products. QuickSpecs at this link for more information: www.hp.com/go/lo100.
Core Infrastructure Management	HP Insight Control for Linux	HP Insight Control for Linux, as a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. The Insight Control for Linux suite installs and license software modules that are integrated into HP System Insight Manager. The HP Insight Control suite for Linux (IC-Linux) serves environments requiring a Linux-based management consoles. See: www.hp.com/go/ic-linux HP Insight Control suites include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Industry Standard Compliance	ACPI V2.0 Compliant PCI 2.2 Compliant PXE Support WOL Support Microsoft® Logo certifications IPMI 2.0, SMASH CLP compliant

Security	Power-on password Setup password Diskette boot control Secure Sockets Layer (SSL) Secure Shell (SSH)
Security - Trusted Platform Module	The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. NOTE: For more information about TPM, including a white paper, go to: http://www.hp.com/go/TPM NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment. NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

Standard Features

Server Power Cords	One 6' Highline (IEC-IEC) power cord ships standard NOTE: HP ProLiant DL servers no longer ship standard with NEMA power cords (163719-002) that allow connection to 110V wall outlets in a home or office. ProLiant DL servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords
Power Supply	500 Watts, auto-switching, high efficiency, PFC (Power Factor Correcting) NOTE: Factory upgradeable to high-efficiency (HE) hot plug common slot redundant power supply.
System Fans	5 system fans ship standard; Non-hot plug, Non-redundant NOTE: The HP Redundant Fan 40x56 1U seG6 Kit (P/N 536576-B21) can be ordered as a factory upgrade for N+1 fan redundancy.
OS Support	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris 10 for x86/x64 based Systems VMware Citrix XenServer NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page http://www.hp.com/support/DL160G6.

Standard Features

Rack Airflow Requirements	Rack 10000 G2 series Cabinets The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors. CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches) CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage. NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server.
Rack Support	The DL Fixed Rail System supports installation in racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36".
Telco Rack Support	Installation into Telco 2 post, and 4 post, or threaded holes racks requires a 3rd party option kit. For additional information, please visit: www.hp.com/go/rackandpower.
Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.
HPC Interconnects	NOTE: High Performance Computing (HPC) interconnect technologies are available for this server under the Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand, Gigabit Ethernet: http://www.hp.com/techservers/clusters/ucp/index.html InfiniBand PCI-Express Generation 2 adapters

Standard Features

HP Enterprise Configurator	The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator.
Service and Support	HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs. HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs. HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22" and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack. To fully capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime. Recommended Service - Simplify ProLiant solution implementation, maintenance and management. • Support Service - 3-Year 24x7 4 hr Response service support coverage • Deployment Service - Hardware Installation Enhanced Service - Optimize service level to increase IT performance and availability • Support - 3Year 24x7 24 hr Call to repair service support coverage • Support- 3-Year 24x7 6 hr Call to repair service support coverage • Support Plus -24x7 24 hr Call to repair service support including OS coverage Operating Installation of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays. For a complete listing of service offerings and information visit: http://www.hp.com/services/proliantservices http://h20219.www2.hp.com/services/us/en/warranty/carepack-servers-proliant.html

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.
NOTE: Configure-to-order servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Configuration (choose one of the following configurable models)

HP Models

Non-Hot Plug SATA Model

NOTE: Non-Hot Plug models are not upgradeable to Hot Plug.
NOTE: The addition of a Smart Array controller is supported for external storage use only.

HP ProLiant DL160se G6 Non-Hot Plug SATA Rack CTO Chassis 495958-B21

Factory Integrated Model ships with:

HP NC362i Integrated Dual Port Gigabit Server Adapter

One available full-length/full-height PCI-Express x16 Generation 2 slot
One available Low Profile PCI-Express x16 Generation 2 slot

One Highline IEC Power Cord

5 Non-Hot Plug Fans

Rack (1U), (1.75 in / 4.45 cm)

Tool-less Fixed Rails

Hot Plug Model

HP ProLiant DL160se G6 Hot Plug SAS/SATA Rack CTO Chassis 495959-B21

Factory Integrated Model ships with:

HP NC362i Integrated Dual Port Gigabit Server Adapter

One available PCI-Express Generation 2 slot:

Slot 1: full-length/full-height
Slot 2: low-profile occupied by controller card

One Highline IEC Power Cord

5 Non-Hot Plug Fans

Rack (1U), (1.75 in / 4.45 cm)

Tool-less Fixed Rails

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

HP Processors	Quad-Core Processors	
	NOTE: If 2 processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.	
	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO	508231-L21
	Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO	573893-L21
	Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3), FIO	491511-L21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	490461-L21
	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	573895-L21
	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	490459-L21
	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	491507-L21
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	490457-L21
	NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.	
HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	516423-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	Unbuffered with ECC DIMMs (UDIMMs)	

	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/ NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)	
HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. NOTE: A minimum of one hard drive is required when purchasing Non-Hot Plug CTO Chassis Model (P/N 495958-B21) in Step 1. NOTE: SATA Non-Hot Plug Hard Drives ONLY required when purchasing Non-Hot Plug CTO Chassis Models (P/N 495958-B21) in Step 1.	
	SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21
	SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
	HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	571232-B21
	HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	458947-B21

Configuration Information - Factory Integrated Models

HP Storage Controllers	NOTE: A minimum of one Smart Array Controller is ONLY required when purchasing Hot Plug CTO Chassis Model (P/N 495958-B21) in Step 1. The HP Smart Array P212 (491191-B21) is supported in the Non-Hot Plug Model (P/N 495958-B21) for external storage control ONLY. The HP Smart Array P410 Controller is not supported in the Non Hot Plug Model. NOTE: The addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the Smart Array Advanced Pack license (P/N 516471-B21).	
	HP P212/256MB FIO Smart Array BBWC	491191-B21
	HP P410/Zero Memory FIO Smart Array Controller	462860-B21
HP Power Supplies	NOTE: Many HP ProLiant Servers now offer new power options, including Common Slot Power Supplies. These power supplies come in multiple power ratings and higher efficiency levels to offer the Right Size solution to fit your configuration. This provides improved power delivery and the advantage of reclaiming lost power. Prior to making a power supply selection it is "highly recommended" that the "HP Power Advisor" is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor. NOTE: The 400W 1U G6 RPS (P/N: 532092-B21) is limited to the following configuration support: (1.) NHP SATA Model (P/N: 495958-B21), (2.) Up to 2 60W Low Voltage processors (P/N: 491507-L21, -B21), (3.) No graphics cards supported via PCI-e.	
	HP 500 Watts Non Hot Plug Power Supply Factory Integrated Kit	515915-B21
	HP High Efficiency 460W Power Supply/Backplane/Bracket G6 Factory Integrated Kit	535684-B21
	HP High Efficiency 750W Power Supply/Backplane/Bracket G6 Factory Integrated Kit	535683-B21
	HP 400 Watts 1U G6 Redundant Power Supply Option Kit	532092-B21

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

HP Drive Cage Options	HP 8SFF HDD Cage & Backplane G6 FIO NOTE: Installation of the HP 8SFF HDD Cage & Backplane G6 FIO Kit is required when installing small form factor drives.	515938-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below.

Core Options

NOTE: Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

HP Unique Options	HP Dedicated Management Port Kit	516006-B21
	HP Internal USB Cable G6 Kit	536769-B21
	NOTE: This option required to connect a USB device internally.	
HP Processors	Quad-Core Processors	
	Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	508231-B21
	Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	573893-B21
	Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3)	491511-B21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	490461-B21
	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	573895-B21
	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)	490459-B21
	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)	491507-B21
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)	490457-B21
	NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.	

Core Options

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	516423-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/	
HP Optical Drives	HP 9.5mm SATA DVD-ROM Optical Drive	481045-B21
	HP 9.5mm SATA DVD RW Optical Drive	481047-B21
HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	
	SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives (SAS/SATA Hot Plug Models Only) NOTE: A SAS HBA or Array Controller is required.	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
	SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives (Non-Hot Plug Models Only)	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21

HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21
SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21
NOTE: Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html	
SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	571232-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	458947-B21
SATA Hot Plug Midline (MDL) Solid State Drives	
HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21
HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
SATA Hot Plug 3.5" Midline (MDL) Solid State Drives	
HP 60GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570761-B21
HP 120GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570763-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13415_na/13415_na.html	
SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 300GB 3G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	492620-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 3G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	504062-B21
HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 146GB 3G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418367-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
HP 72GB 3G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	418371-B21
SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21

Core Options

	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
	HP 450GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	454232-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
	HP 300GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	416127-B21
	HP 146GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	384854-B21
	NOTE: The purchase of SAS HBA or array controller is required.	
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
	SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
	HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
	SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
	HP 1TB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461137-B21
	HP 750GB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461135-B21
HP Networking	Gigabit Ethernet Adapters	
	HP NC112T PCIe Gigabit Server Adapter	503746-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	10 Gigabit Ethernet Adapters	
	HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21
	NOTE: A minimum of two Gigabtyes (2GB) of server memory is required for each NC522SFP adapter.	
	NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.	
	HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
	NOTE: A minimum of two Gigabytes (2 GB) of server memory is required per each NC550SFP adapter.	
	NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.	

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Additional Options

HP Entry-Level Server Management	HP LO100i Advanced Pack, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: For additional License Kits please see the Lights-Out 100i QuickSpecs at: www.hp.com/go/lo100	530521-B21
HP Insight Software	**HP Insight Control for Linux**	
	HP Insight Control for Linux, 1-server license, including one year of 24x7 Technical Support and Updates, Electronic	TC213AAE
	HP Insight Control for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates NOTE: This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. NOTE: Electronic LTUs are only available through limited points of sales; if not available, order a printed license entitlement certificate instead.	TC209A
	HP Insight Control for Linux, Media pack (DVD) - No licenses included NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately. NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ic-linux (click on Download button). NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and are available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent. NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service. NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html	TC208A
	HP Insight Control server deployment	
	HP Insight Control server deployment Electronic License including 1 year 24x7 Technical Support and Updates	T9082AAE
	HP Insight Control server deployment 1-Server License including 1 year 24x7 Technical Support and Updates NOTE: Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key, and is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent. NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service. NOTE: For additional license kits please see the Insight Control QuickSpecs at:	452151-B21

http://h18004.www1.hp.com/products/quickspecs/12631_na/12631_na.html

HP Drive Cage Options	HP 4HDD Hot Plug Backplane G6 Kit	512181-B21
	NOTE: Installation of the 4 HDD Hot Plug Backplane G6 Kit (512181-B21) is required if ordering third or fourth Hard Drives for Hot Plug models only.	
HP Security - TPM	HP Trusted Platform Module Option Kit	488069-B21
HP Storage Controllers	NOTE: The addition of storage controllers for internal hard drive use is intended for use ONLY with the Hot Plug SATA/SAS Model Chassis (P/N 495959-B21). The addition of a storage controller to the Non-Hot Plug Model Chassis (P/N: 495958-B21) is supported for external storage ONLY.	
	NOTE: With the HP Smart Array P410 Controller, the addition of the battery backed cache upgrade enables BBWC, RAID 5, 5+0, array expansion, logical drive extension, RAID migration, and stripe size migration. In order to upgrade to RAID 6, at least 256MB Cache and a Battery is required in addition to the Smart Array Advanced Pack license (P/N 516471-B21).	
	SAS Controllers	
	Smart Array P212 Controller	
	HP Smart Array P212/Zero Memory Controller	462828-B21
	HP Smart Array P212/256MB Controller	462834-B21
	Smart Array P410 Controller	
	HP Smart Array P410/256MB Controller	462862-B21
	HP Smart Array P410/256MB BBWC	491195-B21
	HP Smart Array P410/512MB BBWC Controllers	462864-B21
	HP Smart Array P410/1G with FBWC	572532-B21
	HP Smart Array P410/512MB with FBWC	578230-B21
	Smart Array P411 Controller	
	HP Smart Array P411/512MB Flash Backed Write Cache	578229-B21
	HP Smart Array P411/1G Flash Backed Write Cache	572531-B21
	Smart Array P812 Controller	
	HP Smart Array P812/1G Flash Backed Cache Controller	487204-B21
	Storage Controllers for use with External Storage Only	
	HP Smart Array P411/256MB Controller	462830-B21
	HP Smart Array P411/512MB BBWC	462832-B21
	NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html (Smart Array P410 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html (Smart Array P411 Controller) http://h18000.www1.hp.com/products/quickspecs/13558_na/13558_na.html	

	(Smart Array P812 Controller)	
	Optional upgrades	
	HP Smart Array Advanced Pack No Media 1-Server license including 1yr 24x7 Technical Support	516471-B21
	NOTE: This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.	
	1G Flash Backed Write Cache	534562-B21
	512MB Flash Backed Write Cache	534916-B21
	SAS HBA	
	HP SC08Ge Host Bus Adapter	488765-B21
	HP SC08e 6Gb 2-ports Ext PCIe SAS HBA NOTE: This is a 2 x4 External Port HBA.	614988-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/13082_na/13082_na.html (SC08Ge HBA) http://h18004.www1.hp.com/products/quickspecs/13651_na/13651_na.html (SC08e 6Gb HBA)	
HP InfiniBand Options	HP 10 GbE PCI-e G2 Dual Port Adapter	516937-B21
	HP IB 4X DDR CX-2 PCI-e G2 Dual Port HCA	592521-B21
	HP IB 4X DDR PCI-e DUAL PORT HCA	448397-B21
	HP IB 4X QDR CX-2 PCI-e G2 Dual Port HCA	592520-B21
	QLogic IB 4X QDR PCI-e G2 Dual-port HCA	583211-B21
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html	
HP Backup & Recovery Software	**Data Protector Express**	
	HP Data Protector Express 4.0 SP1 Backup Server	BB117BA
	HP Data Protector Express 4.0 SP1 for Microsoft Small Business Server	BB118BA
	HP Data Protector Express Backup Server 4.0 SP1 Upgrade from Data Protector Express Single Server Edition	BB117BT
	NOTE: Only one of these Data Protector Express base products is required. To see available options: http://www.hp.com/go/dataprotectorexpress	

Additional Options

HP Tape Backup	NOTE: For the complete range of StorageWorks tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP StorageWorks tape backup products see: http://www.hp.com/go/connect.	
	HP StorageWorks DAT 160 SAS Internal Tape Drive NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	Q1587A
	HP StorageWorks 1U USB Rack-Mount Kit with one DAT 320 USB Tape Drive	AP835A
	HP StorageWorks DAT 320 SAS Internal Tape Drive NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	AJ830A
	HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	DW085A
	HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive NOTE: For installation into 1U SAS Rack-Mount Kit (AE459B) or 3U SAS Rack-Mount Kit (AG576B). No peripheral bay available for installation into the server. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	EH847A
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Tape Autoloader NOTE: Requires HP 1U Tape Autoloader Rack-Mount Kit (AH166A) for rack installation. Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	AH558A
	HP StorageWorks MSL2024 Tape Library with one LTO-3 Ultrium 920 SAS Drive NOTE: Connection using the HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.	AH559A
HP Disk Backup	NOTE: For the complete range of StorageWorks D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of StorageWorks RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP StorageWorks disk backup products see: http://www.hp.com/go/connect.	
	HP StorageWorks D2D Backup Systems with Backup Data Deduplication	
	HP StorageWorks D2D2502i Backup System NOTE: 1.5TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	EJ001B
	HP StorageWorks D2D2504i Backup System NOTE: 3.0TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	EJ002B
	USB Removable Media RDX Disk Backup Systems	
	HP StorageWorks RDX320 Internal Removable Disk Backup System NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.	AJ767A

Additional Options

	HP StorageWorks RDX500 Internal Removable Disk Backup System NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.	AJ934A
	HP StorageWorks RDX750 Internal Removable Disk Backup System NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 750GB of disk capacity per data cartridge.	AW577A
HP StorageWorks Options	StorageWorks Fibre Channel HBA NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	Brocade Fibre Channel HBAs	
	HP 81B PCIe 8Gb FC Single Port HBA	AP769A
	HP 82B PCIe 8Gb FC Dual Port HBA	AP770A
	HP 41B PCIe 4Gb FC Single Port HBA	AP767A
	HP 42B PCIe 4Gb FC Dual Port HBA	AP768A
	Emulex Fibre Channel HBAs	
	HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
	HP 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
	HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
	HP StorageWorks FC2242SR 4Gb DC PCI-e FC HBA	A8003A
	QLogic Fibre Channel HBAs	
	HP StorageWorks 81Q PCI-e FC HBA	AK344A
	HP 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
	HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
	HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A
	StorageWorks Converged Network Adapter	
	HP CN1000E 2P Converged Network Adapter	AW520A

Additional Options

HP Power Distribution Units	Monitored PDUs	
	HP Monitored Power Distribution Unit: Full Rack Version	
	HP 8.6 kVA S1324 Monitored PDU- single input, 3Ø, 24A	AF504A
	HP 8.3 S1140 Monitored PDU- single input, 1Ø, 40A	AF506A
	HP Monitored Power Distribution Unit: Half Rack Version	
	HP 4.9 kVA S124 Monitored PDU- single input, 1Ø, 24A	AF914A
	Modular Power Distribution Units 1U/0U (Up to 32 outlets)	
	4.9 kVA Modular PDU, 24A	252663-D72
	8.3 kVA Modular PDU, 40A	252663-D73
	3.6 kVA Modular PDU, 16A	252663-B24
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12118_na/12118_na.html	
HP Uninterruptible Power Systems	HP Rack-mountable UPS	
	HP R/T3000 Uninterruptible Power System (UPS)	
	HP R/T3000 UPS, High voltage	AF453A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13417_na/13417_na.html (Worldwide)	
	HP Rack-Mountable R5500 UPS	
	HP R5500 VA UPS	AF426A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/11871_na/11871_na.html	
	NOTE: For additional information on sizing your server, please reference: http://www.upssizer.com	
HP Rack Series	HP Rack 10000 G2 Series (Graphite Metallic)	
	10642 G2 (42U) Rack Cabinet - Pallet	AF001A
	10642 G2 (42U) Rack Cabinet - Shock Pallet	AF002A
	NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.	
	NOTE: Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.html	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	

Additional Options

HP Rack Options	HP KVM Switch Options	
	0x2x16 KVM Server Console G2 Switch with Virtual Media and CAC	AF618A
	0x2x32 KVM Server Console G2 Switch with Virtual Media and CAC	AF619A
	1x1Ex8 KVM IP Console Switch G2 with Virtual Media and CAC	AF620A
	2x1Ex16 KVM IP Console Switch G2 with Virtual Media and CAC	AF621A
	4x1Ex32 KVM IP Console Switch G2 with Virtual Media and CAC	AF622A
	Server console switch 0x2x8	AF616A
	Server console switch 0x2x16	AF617A
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
HP USB and SD Options	HP USB Optical Mouse	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.	
HP Care Pack Services	Hardware Services 4-Hour On-site Service	
	13-Hour x 5-Day Coverage, 3 Years, Electronic	U9509E
	24-Hour x 7 Day Coverage, 3 Years, Electronic	U9510E
	Hardware Services Next Business Day On-Site Service	
	9-Hour x 5-Day Coverage, 3 Years, Electronic	U9508E
	Hardware Services 6-Hour Call to Repair On-Site Service	
	Hardware Installation, Electronic	U9520E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U9511E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack	

Memory

HP ProLiant DL160se G6 (all models)

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

Standard Memory

4GB (2x2GB) or 6GB (3 x 2GB) depending on model, PC3-10600E Unbuffered UDIMM memory, with ECC.

Maximum Memory

Up to 192 GB memory is available with the optional installation of PC3-8500R Registered DIMM memory kits.

NOTE: Charts do not represent all possible memory configurations.

DDR3 memory population guidelines

NOTE: For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For servers with twelve (12) memory slots
- There are three (3) channels per processor; six (6) channels per server
- There are two (2) DIMM slots for each memory channel; twelve (12) total slots
- Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
- Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3;6 on a 3DPC system or 1,4; 2,5; on a 2DPC system
- No mixing DIMM voltage; all DIMMs must be the same voltage

Memory

DIMM Type ->	Registered DIMMs (RDIMMs)						Unbuffered with ECC DIMMs (UDIMMs)			
DIMM Rank ->	Dual Rank (2R)			Quad Rank (4R)			Single Rank (1R)		Dual Rank (2R)	
DIMM Capacity ->	2GB	4GB	8GB	2GB	4GB	16GB	1GB	2GB	1GB	2GB
DIMM Native Speed (MHz) ->	1333	1333	1066	*	1066	1066	1333	*	*	1333
SLOTS THAT CAN BE POPULATED										
12 slot servers	12	12	12	*	12	12	12	*	*	12
								*	*	
MAXIMUM CAPACITY (GB)										
12 slot servers	24	48	96	*	48	192	12	*	*	24
								*	*	
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1066	*	1066	1066	1333	*	*	1333
2 DIMM Per Channel	1333	1333	1066	*	800	800	1333	*	*	1333
* - not supported by HP at this time.										

NOTES:

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- 95 Watt CPU's are required for 1333MHz DIMM speeds. All other CPU's are capable of up to 1066MHz
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

DIMM slot and configuration diagrams

Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

12 DIMM SLOTS (6 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D	1	D	Chnl 1
	2	A	2	A	
Chnl 2	3	E	3	E	Chnl 2
	4	B	4	B	
Chnl 3	5	F	5	F	Chnl 3
	6	C	6	C	

Standard memory configuration (1 CPU model)

- 6GB, consisting of three (3) 2GB dual-rank PC3-10600 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; empty	1	D: empty	Chnl 1
	2	A; 2GB DIMM	2	A: empty	
Chnl 2	3	E; empty	3	E: empty	Chnl 2
	4	B; 2GB DIMM	4	B: empty	
Chnl 3	5	F; empty	5	F: empty	Chnl 3
	6	C; 2GB DIMM	6	C: empty	

Standard memory plus optional memory (1 CPU model)

- 30GB, consisting of three (3) 2GB RDIMMs plus three (3) 8GB RDIMMs
  - 3x 2GB dual-rank PC3-10600 RDIMMs
- 3x 8GB dual-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; 8GB DIMM	1	D: empty	Chnl 1
	2	A; 2GB DIMM	2	A: empty	
Chnl 2	3	E; 8GB DIMM	3	E: empty	Chnl 2
	4	B; 2GB DIMM	4	B: empty	
Chnl 3	5	F; 8GB DIMM	5	F: empty	Chnl 3
	6	C; 2GB DIMM	6	C: empty	

Standard memory replaced with optional memory (1 CPU model)
RDIMM maximum configuration

- 96GB, consisting of six (6) 8GB dual-rank PC3-8500R-7 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; 16GB DIMM	1	D; empty	Chnl 1
	2	A; 16GB DIMM	2	A; empty	
Chnl 2	3	E; 16GB DIMM	3	E; empty	Chnl 2
	4	B; 16GB DIMM	4	B; empty	
Chnl 3	5	F; 16GB DIMM	5	I: empty	Chnl 3
	6	C; 16GB DIMM	6	C; empty	

UDIMM maximum configuration (1 CPU model)

- 12GB, consisting of six (6) 2GB dual-rank PC3-10600 UDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; 2GB DIMM	1	D; empty	Chnl 1
	2	A; 2GB DIMM	2	A; empty	
Chnl 2	3	E; 2GB DIMM	3	E; empty	Chnl 2
	4	B; 2GB DIMM	4	B; empty	
Chnl 3	5	F; 2GB DIMM	5	F; empty	Chnl 3
	6	C; 2GB DIMM	6	C; empty	

Standard memory replaced with optional memory (2 CPU model)
RDIMM maximum configuration

- 192GB, consisting of twelve (12) 8GB dual-rank PC3-8500R-7 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; 16GB DIMM	1	D; 16GB DIMM	Chnl 1
	2	A; 16GB DIMM	2	A; 16GB DIMM	
Chnl 2	3	E; 16GB DIMM	3	E; 16GB DIMM	Chnl 2
	4	B; 16GB DIMM	4	B; 16GB DIMM	
Chnl 3	5	F; 16GB DIMM	5	F; 16GB DIMM	Chnl 3
	6	C; 16GB DIMM	6	C; 16GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 24GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D; 2GB DIMM	1	D; 2GB DIMM	Chnl 1
	2	A; 2GB DIMM	2	A; 2GB DIMM	
Chnl 2	3	E; 2GB DIMM	3	E; 2GB DIMM	Chnl 2
	4	B; 2GB DIMM	4	B; 2GB DIMM	
Chnl 3	5	F; 2GB DIMM	5	F; 2GB DIMM	Chnl 3
	6	C; 2GB DIMM	6	C; 2GB DIMM	

NOTE: Capacity references are rounded to the common Gigabyte values.

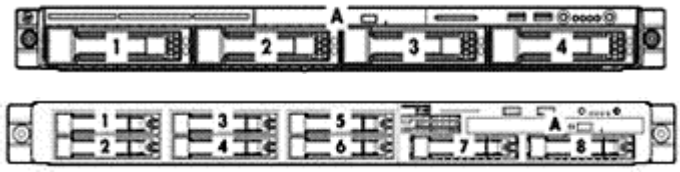
- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB

Memory

- 16GB = 16384MB

Following are memory options available from HP:

Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	516423-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/	



1-4 Four Non-hot plug SATA or four 3.5" Hot-plug SAS/SATA hard drive bays
A Optional DVD-ROM, or DVD RW
1-8 Eight 2.5" Hot-plug SATA/SAS hard drive bays
A Optional DVD-ROM, or DVD RW

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
DVD-ROM	Up to 1	A	Integrated IDE (ATAPI) (optional)
DVD RW	Up to 1	A	Integrated IDE (ATAPI) (optional)

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3GSATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K 160GB 3G SATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Transfer rate: 1.5 Gb/s SATA

SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3G SATA 7.2K 160GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212Controller HP Smart Arrays P410Controller NOTE: Support for transfer rates up to 3 Gb/s

SATA Hot Plug 3.5" Entry (ETY) Drives

Storage

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K 160GB 3G SATA 7.2K	Up to 4	1-4	HP Embedded SATA RAID Controller NOTE: Support for transfer rates up to 3 Gb/s

SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD 120GB 3.0G SATA SSD	Up to 8	1-8	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3G SATA SSD 120GB 3G SATA SSD	Up to 4	1-4	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 6G SAS 7.2K DP	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller HP Smart Array P212/Zero Memory Controller HP Smart Array P212/ 256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 6G SAS 7.2K 1TB 6G SAS 7.2K 1TB 3G SAS 7.2K 750 3G SAS 7.2K	Up to 4	1-4	HP Smart Array P212Controller HP Smart Arrays P410Controller NOTE: Support for transfer rates up to 3 Gb/s

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G SAS 10K 300GB 3G SAS 10k 146GB 6G SAS 15K 146GB 3G SAS 15K 146GB 6G SAS 10K 146GB 3G SAS 10K 72GB 6G SAS 15K 72GB 3G SAS 15K	Up to 4	1-4	HP Smart Array P212Controller HP Smart Array P410Controller NOTE: Support for transfer rates up to 3 Gb/s

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K 450GB 6G SAS 15K 450GB 3G SAS 15K 300GB 6G SAS 15K 300GB 3G SAS 15K 146GB 3G SAS 15K	Up to 4	1-4	HP Smart Array P212Controller HP Smart Array P410Controller NOTE: Support for transfer rates up to 3 Gb/s

Tape and Disk-Based Backup

NOTE: For the complete range of StorageWorks tape drives, autoloaders, libraries and media, including the internal fitting models, see: http://www.hp.com/go/tape. For the complete range of StorageWorks D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of StorageWorks RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP StorageWorks disk and tape backup products see: http://www.hp.com/go/connect.

	Position	Recommended Controller	Part Number
HP StorageWorks SCSI Tape Drives LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter Please check the full compatibility information at: http://www.hp.com/go/connect	412911-B21
HP StorageWorks USB Tape Drives DAT 40 DAT 72	External	USB 2.0 Port	N/A

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DAT 160
DAT 320
1U USB Rack-Mount Kit

HP StorageWorks SAS Tape Drives DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000 LTO-5 Ultrium 3280 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P212 SAS controller Please check the full compatibility information at: http://www.hp.com/go/connect	462828-B21
HP StorageWorks SCSI Tape Autoloaders DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Host Bus Adapter Please check the full compatibility information at: http://www.hp.com/go/connect	412911-B21
HP StorageWorks SCSI Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Controller Please check the full compatibility information at: http://www.hp.com/go/connect	AH627A
HP StorageWorks SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212 SAS controller Please check the full compatibility information at: http://www.hp.com/go/connect	462828-B21
HP StorageWorks Fibre Channel Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpecs.	
HP StorageWorks USB RDX Removable Disk Backup System RDX160 RDX320	External	USB 2.0 port	N/A

Storage

RDX500
RDX750

HP StorageWorks D2D Backup Systems, iSCSI D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.
HP StorageWorks D2D Backup Systems, Fibre Channel D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/go/connect

Power Specifications

HP High Efficiency 750W Power Supply/Backplane/Bracket G6 Factory Integrated Kit							
Part Number	535683-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	**100**	**120**	**200**	**208**	**220**	**230**	**240**
Max Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	857	847	824	825	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	854	854	854	854
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797

HP 500 Watts Non Hot Plug Power Supply Factory Integrated Kit						
Part Number	515915-B21 Option Kit					
Input Voltage Range (Vrms)	100 to 240					
Frequency Range (Nominal) (Hz)	47/63					
Nominal Input Voltage (Vrms)	**100**	**120**	**200**	**220**	**230**	**240**
Maximum Rated Output Wattage	500	500	500	500	500	500
Nominal Input Current (A rms)	5.74	4.99	2.86	2.58	2.46	2.36
Max Rated Input Wattage Rating (Watts)	568	568	562	556	556	556
Max. Rated VA (Volt-Amp)	574	574	573	567	567	567
Efficiency (%) at Max. Rated Output Wattage	88	88	89	90	90	90
Power Factor	0.99	0.99	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.42	0.50	0.81	0.91	0.95	1.00
Max. Inrush Current (A peak)	30					
Max. Inrush Current duration (mS)	20					
Maximum British Thermal Unit Rating (BTU-Hr)						

Power Specifications

HP High Efficiency 460W Power Supply/Backplane/Bracket G6 Factory Integrated Kit							
Part Number	535684-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	**100**	**120**	**200**	**208**	**220**	**230**	**240**
Maximum Rated Output Wattage	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Max Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Max. Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%) at Max. Rated Output Wattage	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Max. Inrush Current (A peak)	30						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

HP 400 Watts 1U G6 Redundant Power Supply Option Kit							
Part Number	532092-B21 Option Kit						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	**100**	**120**	**200**	**208**	**220**	**230**	**240**
Maximum Rated Output Wattage	320	320	360	360	360	360	360
Nominal Input Current (A rms)	4.15	3.41	2.23	2.16	2.03	1.94	1.86
Max Rated Input Wattage Rating (Watts)	412	406	445	445	444	443	443
Max. Rated VA (Volt-Amp)	413	407	447	447	446	446	445
Efficiency (%) at Max. Rated Output Wattage	77.4	78.5	80.5	80.6	80.7	80.8	81.0
Power Factor	0.99						
Leakage Current (mA)	0.75	0.75	0.85	0.90	0.95	0.95	1.00
Max. Inrush Current (A peak)	35						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1354	1334	1462	1462	1459	1456	1456

NOTE:
To review typical system power ratings use the Active Answers Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

Power		
ProLiant DL160se G6 Fully Configured	115V/60Hz	220V/50Hz
Fully Loaded System Input Wattage (W)	448	445
Fully Loaded System Input Current (A rms)	3.833	2.046
Fully Loaded System Thermal (BTU- Hr)	1529	1518
Fully Loaded System VA (Volt-Amp)	449	454
System Inrush Current with all power supplies loaded (A)	10.1	10.96
Power cord requirements	Nema 5-15P to IEC320-C13	IEC320-C13 to IEC320-C14
NOTE: Power shown is for a fully configured system consisting of (2) CPU, (8) double-sided DIMMs, (2) HDDs, (1) CD-ROM, and (2) PCI cards.		
Power Cord	AF556A	

Server Power Cords

One 6' Highline (IEC-IEC) power cord ships standard

NOTE: HP ProLiant DL servers no longer ship standard with NEMA power cords (163719-002) that allow connection to 110V US wall outlets in a home or office. ProLiant DL servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately.

If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

System Unit	Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)		
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	34.00 lb (16.78 kg)	
		Minimum (one hard drive, power supply, and processor installed)	28.00 lb (12.7 kg)	
	Input Requirements (per power supply)	Rated Line Voltage	90 to 132 VAC 180 to 264 VAC	
		Rated Input Current	5. 8 Amps (at 100 VAC) to 2.9 Amps (at 200 VAC)	
		Rated Input Frequency	47 to 63 Hz	
	BTU Rating	Rated Input Power	570W (at 100 VAC) 565W (at 200 VAC)	
		Maximum	500W	1940 BTU / hr (at 100 VAC) 1920 BTU/hr (at 200 VAC)
			460W	1773 BTU / hr (at 120 VAC) 1715 (at 240 VAC)
			750W	2892 BTU / hr (at 120 VAC) 2797 (at 240 VAC)
	Power Specifications	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient Or www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: DL160 G6 - Follow the instructions of the next screens.		
	Power Supply Output (per power supply)	Rated Steady-State Power	500 Watts (at 100 VAC), 500 Watts (at 200 VAC)	
		Maximum Peak Power (See Power Specifications Tables)	500Watts (at 100 VAC), 500 Watts (at 200 VAC)	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options	

		installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	LWAd	6.4 B
	LpAm	49dBA
	Operating	
	LWAd	6.4 B
	LpAm	49dBA
Emissions Classification (EMC)	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Technical Specifications

NC362i Integrated Dual Port Gigabit Server Adapter	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	Data Transfer Method	Compliant to x1 PCIe Specification
	Controller	Intel® 82576
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s 10Base-T (Full-Duplex) 20 Mb/s 100Base-TX (Half-Duplex) 100 Mb/s 100Base-TX (Full-Duplex) 200 Mb/s 1000Base-TX (Half and Full-Duplex) 2000Mb/s
	Connector	RJ-45 connector
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethemet on standard Category 5 UTP

Smart Array P410/410i Controller	Disk Drive and Enclosure Interface	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)
	SAS Connectors	2 internal (Mini-SAS) x8 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe 2.0 provides 2GB/s maximum bandwidth
	SAS Speed	x8 6Gb/s SAS provides 4.8GB/s maximum bandwidth
	Cache Memory	40-bit 256MB ECC protected cache (72-bit 512MB BBWC module upgrades available); transportable with battery-backed upgrade
	Logical Drives Supported	Up to 64 logical drives
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) NOTE: The minimum of 256 MB cache, battery kit, and Smart Array Advanced Pack License Key upgrade is required to enable RAID 6, 6+0 RAID 5, 5+0 (Distributed Data Guarding) NOTE: The 256 MB is required to enable RAID 5, 5+0 support of the Smart Array P410 RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.